

Procedure Execution and Projection System, Phase I

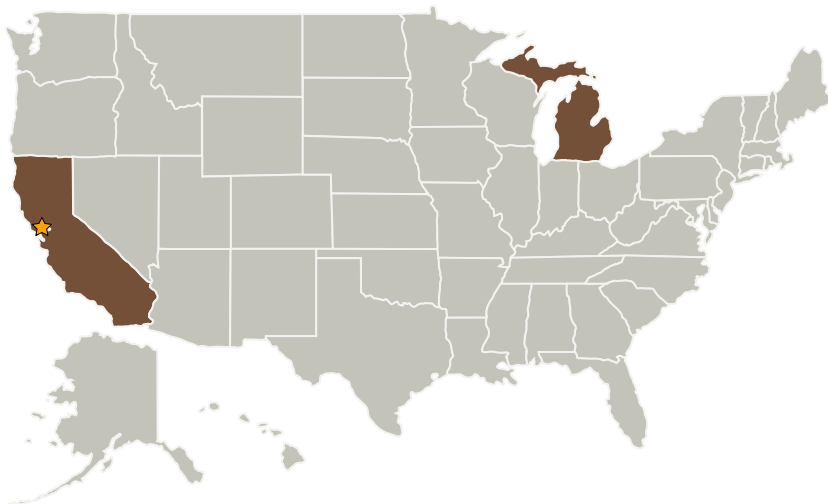
Completed Technology Project (2009 - 2009)



Project Introduction

There is a persistent pressure upon NASA crew members to achieve very high productivity during their missions. Significant challenges exist to maintaining manageable workload while the crew is performing their many and varied tasks allotted for each day while ensuring the crew maintain situation awareness. NASA crew members deal with a large amount of very high technology equipment and perform experiments and procedures that can be extremely long and complex. The solution will require the development of automated management technologies that will operate synergistically with the crew, automating tasks of varying complexity in a dynamic, flexible manner with representations of automation state that the crew is familiar and comfortable with. In this proposal, Cybernet proposes to leverage crew members' capabilities with the design of a distributed Procedure Execution and Projection (PEP) system that focuses on supporting automation of complex procedures while ensuring crew situational awareness and anticipating future problems. Our team will leverage the recent work on the Procedure Representation Language (PRL) and the flexible, distributed and hierarchical capabilities of holonic systems. PRL is an XML encoding of the vehicle/habitat procedures in a form that both crew and automation can use, and the PEP systems' intelligent holonic modules will support crew with a range of capabilities, including automation of procedures, projection of procedures to look for problems and determine courses of action to prevent or mitigate the problems, and make sure that the crew maintain situational awareness of the procedural state. The objectives of the Phase I project are to establish critical requirements for NASA vehicle and habitat crew automation and to design and implement a prototype of the PEP system to demonstrate approach viability.

Primary U.S. Work Locations and Key Partners



Procedure Execution and Projection System, Phase I

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Procedure Execution and Projection System, Phase I

Completed Technology Project (2009 - 2009)



Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Cybernet Systems Corporation	Supporting Organization	Industry	Ann Arbor, Michigan

Primary U.S. Work Locations

California	Michigan
------------	----------

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.3 Mechanical Systems
 - └ TX12.3.8 Docking and Berthing Mechanisms and Fixtures